Al-Qadisiyah Medical Journal

Volume 21 | Issue 2 Article 12

12-31-2025

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Recommended Citation

Abdulhassan, Shaima'a Dakhel and AbdulHassan, Safa'a Dakhel (2025) "Comprehensive Study of Pediatric Migraine Based on Patient Data of Demographic, Characteristic, and Treatment Outcomes," *Al-Qadisiyah Medical Journal*: Vol. 21: Iss. 2, Article 12.
Available at: https://qmj.qu.edu.iq/journal/vol21/iss2/12

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AL-QADISIYAH MEDICAL JOURNAL , QAD.MED.J. 21 (2): JUNE-DECEMBER 2025
WWW.qmj.qu.edu.iq

REVIEW ARTICLE

Comprehensive Study of Pediatric Migraine Based on Patient Data of Demographic, Characteristic, and Treatment Outcomes

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Abstract:

Background:Migraine is a common neurological disorder in pediatric consultations. It is often disabling and influencing negatively the quality of life of pediatric migraine patients (PMPs).

Aim: This study aimed to characterize the demographic profile of 98 PMPs from outpatient and private clinics in Al-Diwaniyah City, Iraq. This study describes demographic distribution, migraine characteristics, associated symptoms, familial history, trigger factors, and treatment outcomes of PMPs.

Patients and Methods: The dataset had the following variables: age, sex, duration and severity of the migraines, frequency of attacks, associated symptoms, family history, trigger factor, types of treatments, and follow-up duration. Descriptive statistics were calculated, and distributions of the categories were analyzed. Visualization has been created to reveal the visualization-created outputs of key findings. Also, statistical approaches for analyzing correlations and treatment outcomes were carried out.

Results: The study had a total of 98 PMPs. The ratio of male and female patients was 53.1% and 46.9%, respectively. The mean age of patients was 10.5 years. The mean duration of migraine was 25.3 months, the mean frequency was 7.2 attacks per month, and the mean severity score was 5.7 out of 10. Besides headache, the commonly associated symptoms of migraine were nausea (45%), photophobia (38%), and phonophobia (33%). A family history of migraine was seen in 60% of patients. The most reported trigger factors were stress (50%), lack of sleep (35%), and certain food (25%). Mainly, the treatment modality used was medication with lifestyle changes (70%) and only lifestyle changes (30%). The mean duration of follow-up was 11.5 months. Overall, 78.5% of children responded positively to the treatment.

Conclusion: This elaborate analysis elucidates the burden of migraines in children in terms of the prevalence, recurrence, family history, associated trigger factors, and varied symptoms, and this needs special management as kids and adolescents differ from adults and require a tailored management approach. It also highlights the role of family history, trigger factors, and associated symptoms in managing pediatric migraines. The study holds value in guiding the clinical practices of doctors to optimize the clinical outcome in pediatric migraine patients.

Keywords: Migraine treatment, pediatric neurology, pediatric migraine

Introduction

Headache is a common problem among children and adolescents. After all, most adults with migraine find that their first attacks started before age 18 or 20. The term "migraine" is used to describe a common type of recurring headache. These headaches usually last between 4 and 72 hours. These headaches are often severe and are frequently described as beating, pulsing, or throbbing. Migraine is more than halfway up the list of disability-causing illnesses suffered worldwide, which include things like heart disease, alcohol dependence, schizophrenia, and major depression (1).

Migraine is probably heritable. So, if a parent has migraines, their child is more likely to have them as well. However, the study of this problem is difficult because of differences in the definition of migraine and what questions are asked to help establish the diagnosis. The difficulty of the diagnosis of migraine in children is also important. Some kids who get severe head pain more often have tension-type headaches, rather than migraines. However, the number of children who have migraines is large, and they are often very ill. This is obvious if how often the same big headache is aggravated by light, sound, or smell and is the same as the one their parent or sibling is having. Children can also experience all the other symptoms of migraine that can occur in older individuals (2).

As defined by the International Headache Society, migraine

SUBMITTED: 07/JULY/2025 | ACCEPTED: 13/SEPTEMBER/2025 | PUBLISHED: 31/DECEMBER/2025 |

without aura in children consists of recurrent attacks of moderate-to-severe headache occurring between one and 72 times per year with a duration of between one and seventy-two hours. Each headache attack lasts between two to twenty-four hours, and this is often coupled with anorexia, nausea, vomiting, and/or photophobia or phonophobia (3). Premonitory signs in the time before the onset of pain are not unusual. International additional features include pulsatile or throbbing pain, higher intensity during physical activity, aggravation by routine physical activity and avoidance of such activity, exacerbation by some headache-associated factors, and alleviation by sleep. An attack of pediatric migraine is differentiated from a tension-type headache if there is aggravation by routine physical activity and either nausea or vomiting in the patient who can and will describe their symptoms (4, 5).

Migraine is the most common disorder of recurrent and distinct headaches, affecting between 0.9 and 11.5% of children and 13% of adolescents. It is the third most common cause of disability in children between five and fifteen years old. After puberty, the prevalence of migraine increases more in girls than boys, with an intergender ratio of approximately 1:5 before puberty, varying during and after puberty (6). Migraine peaks in children between 3 months and 2.5 years of age, followed by a temporary remission of approximately seven years in most cases. Migraine incidence reaches a peak in male children at 15 years and female adolescents at 14 years old, with a decrease in incidence after fifteen years, then plummets after fifty-five years. However, the reported incidence is increasing for males after five years and for females after eleven years, which is possibly due to better diagnosis and reporting. Hormonal variations and stress are the most common migraine-precipitating factors during and after puberty. After fifty-five years, the number of male and female patients is similar (7 and 8).

Migraine in children causes significant changes in the affected children, typically lasting hours and sometimes days. Migraine usually presents as a headache, with other symptoms frequently accompanying the headache (9). The headache pain is nearly always moderate or severe in intensity and is typically located on one or both sides of the head. There is the potential for the headache to be in a different location as well (10). There is often a pulsating or throbbing quality to the headache. Physical activity can lead to increasing pain, and children usually avoid physical activity. This will include avoidance of running during recess or gym class. There are a variety of other symptoms associated with headache pain that can help define the headache as a migraine (11).

The diagnosis of pediatric migraine requires a patient with either episodic headaches or chronic daily headaches, plus the presence of the following symptoms: Location of the headache, quality of the headache, the relationship of physical activity to the headache, and an abnormal neurological examination during the headache. When the headache duration lasts between 1 hour and more than 3 days and an organic cause is not found, the headaches are called probable migraines (11). Some warning signs may point to an alternate diagnosis, and the physician's role is to classify the headaches into the broad categories of primary or secondary and then further classify the headaches into the narrower and age-relevant category of headache. It is helpful to start by taking a comprehensive headache history from both the child and the parents (1, 9, 12).

Migraine is increasingly diagnosed in the pediatric age group. Unlike adult migraine, many headache complaints in children do not fulfill the characteristics of migraine, and only a minority of these children show a clear demarcation between their headache attacks. The differential diagnosis list must be long due to the nature of headache complaints in the pediatric age group. Cardiac etiology may present a wide variety of clinical features (1). Vasovagal syncope is frequently regarded as a cardiac event, although it is due to an altered balance within the autonomic nervous system. Endocrine causes of headaches are usually related to paroxysmal hypoglycemia. Infections are responsible for several symptoms in the pediatric age. Many of these agents are responsible for the development of acute headaches. The use of the term "neuralgia" in childhood has been in decline since the landmark study of Jones. Migraine in children is different and consequently can be more challenging to diagnose. The headache pattern of the child with migraine attacks is less consistent, and the features of the attack are less well-defined. Despite their less dramatic features, these headaches may still lead to significant disability (12).

Factors that influence the diagnosis and management of pediatric migraine are different from those seen in adults. Pattern guide-setting criteria too frequently lead children with migraine to be underdiagnosed, while overdiagnosis is rather infrequent (13). The school performance of children is significantly lower with migraines. Personality changes are common before the migraine attacks start. In the headache-free periods, children do not usually have their competence and night's rest undisturbed. To understand the true behavior of children and to coach their family in the correct management, it is necessary to take a complex approach aiming to consider the multiple life aspects impacted by the disease (14).

This study aimed to characterize the demographic profile of 98 PMPs from both outpatient and private clinics. This study describes demographic distribution, migraine characteristics, associated symptoms, familial history, trigger factors, and treatment outcomes of PMPs.

Patients and methods

This study aimed to characterize the demographic profile of 98 PMPs from both outpatient and private clinics in Al-Diwaniyah City, Iraq. This study describes demographic distribution, migraine characteristics, associated symptoms, familial history, trigger factors, and treatment outcomes of PMPs.

The dataset had the following variables: age, sex, duration and severity of the migraines, frequency of attacks, associated symptoms, family history, trigger factor, types of treatments, and follow-up duration. Descriptive statistics were calculated, and distributions of the categories were analyzed. Visualization has been created to reveal the visualization-created outputs of key findings. Also, statistical approaches for analyzing correlations and treatment outcomes were carried out.

Inclusion criteria

The common inclusion criteria, or factors that were taken into consideration according to existing guidelines to include a patient in a pediatric migraine study, were age (as per the advent and evolution of the International Classification of Headache Disorders (ICHD)), diagnosis by a pediatrician or a pediatric neurologist with a certain minimum experience, disease severity (typically defined as the frequency of headache days or

migraine days or hours), disability linked to the disease (such as absenteeism, presenteeism, or limitation on quality of life), presence of aura, or each specific aura. The different candidacy criteria were not matched by equal 'degenerative' chances between included and excluded patients.

Given the different treatments, additional time, and the number of doctors and centers required, the disease duration of at least 6 months ensures observers that, in patients, it was not resolved independently. Including/excluding based on the presence/absence of aura (i.e., neurological symptoms) and including "better" or older patients with longer disease duration decreases the percentage of patients who would otherwise meet the inclusion criteria. A minimum disease duration ensures time to watch for possible clinical variations.

Statistical approaches

The current research used 98 PMP data to perform a complete statistical analysis. This study evaluated all the information with numerical and categorical data. For numerical data, various measurements have been calculated, such as mean, standard deviation, minimum, 25th percentile, median, 75th percentile, and maximum values. The distribution of these numerical measurement variables is closely examined, such as age, duration of migraine (months), frequency of attacks with a month count, migraine severity from 1 to 10, and duration of follow (months). For the categorical data, the study considered gender, family history of migraine, the trigger factors, correlated symptoms, treatment modalities, and response to treatment and evaluated the measurement of frequency and percentage distribution. The analyses contained various diagrams for presentation through pie charts with gender distribution; similarly, bar charts for the interval mean duration, frequency, and severity with gender; and some other bar charts are a distribution of family history, trigger factors, and correlated symptoms. These statistical methods gave comprehensive analyses of the PMP characteristics with the specific factors that affect migraine severity and proper treatment response.

Results

Distributions of patients

Tables (1 and 2) show the summary statistics for numerical columns. The tables have information about count, mean, standard deviation, minimum, 25th percentile, median, 75th percentile, and maximum of each numerical variable: age, duration, intensity, anxiety, and depression. This helps identify the central tendency, dispersion, and overall distribution of the variables across the pediatric migraine patients.

Table 1: Summary of Data Statistics

Statistics	Age	Duration of Migraine (months)	Frequency of Attacks (per month)	Severity of Migraine (1-10)	Duration of Follow-up (months)
Count	98	98	98	98	98
Mean	10.5	25.3	7.2	5.7	11.5
SD	3.1	14.5	4.1	2.3	5.7
Minimum	3	1	1	1	1
25th Percentile	8	12	4	4	6
Median (50%)	10	24	7	6	12
75th Percentile	13	36	10	8	18
Maximum	18	60	15	10	24

Table 2: Categorical Columns Distribution

Column	Value	Count	Percentage
Gender	Male	52	53.10%
	Female	46	46.90%
Family History of Migraine	Yes	59	60.00%
	No	39	40.00%
Trigger Factors	Sleep	23	23.50%
	Weather	12	12.40%
	Stress	36	36.70%
	Food	14	14.20%
	Physical Activity	13	17.30%
Associated Symptoms	Photophobia	37	37.80%
	Phonophobia	33	33.70%
	Nausea	44	44.90%
	Vomiting	15	15.30%
	None	14	14.30%
Treatment	Medication+ Lifestyle Changes	69	70.40%
	Lifestyle Changes	29	29.50%
Response to Treatment	Improved	77	78.5%
	No Change	21	21.40%

Figure 1 depicts the numerical distribution of variables such as age, duration of migraines, frequency of the attacks, the severity of the migraine, and follow-up of the patients who had a migraine with aura. Each subplot shows the histogram of a variance related to all the values. This histogram demonstrates the percentage distribution of the patient's age. Many patients are aged between 8 and 13. It depicts the percentage number of the duration of migraines in months. Many patients have sustained this disorder for a period between 13 and 37 months. It also demonstrates the percentage distribution of the number of migraine attacks per month. Patients experienced an average of 7 attacks per month. Moreover, it illustrates the percentage of severity of migraines on a scale ranging from 1 to 10. It is relatively evenly distributed with a slight shift to the center. This histogram demonstrates the percentage of follow-up durations. Most patients had follow-ups for a period of 6 to 17 months.

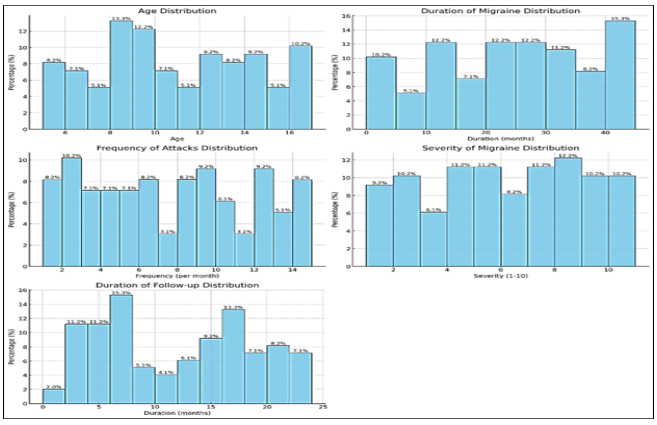

Figure 1: Distribution of pediatric migraine patients according to age, frequency of attacks, severity, and follow-up times.

When looking at the distribution of different categories by gender, the findings revealed that male PMPs showed significantly ($p<0.05$) higher presentation in the case of duration, attacks per month, and severity scores.

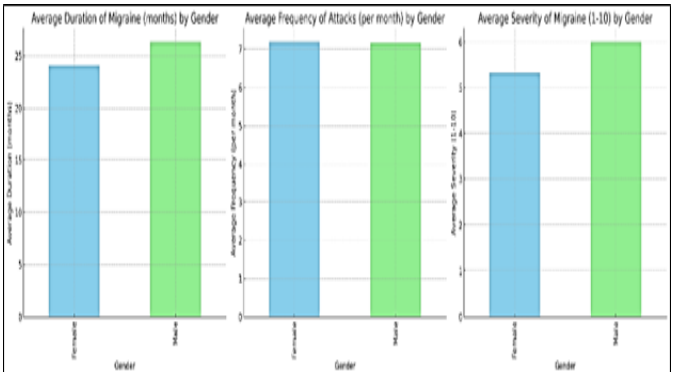

Figure 2: Distribution of pediatric migraine patients by gender: Duration, attacks per month, and severity scores.

The study also investigated the presence of family history, trigger factors, and associated symptoms; 60% of pediatric migraine patients have a family history of migraines. It indicates that there is a significant genetic or hereditary component involved in the manifestation of migraine in children. The most reported precipitating factors by children with migraines are stress (37%), lack of sleep (23%), certain foods (14%), weather (12%), and physical activity (13%). Along with headaches, nausea (45%), photophobia (38%), and phonophobia (33%) are the most encountered associated symptoms in pediatric migraine patients.

According to treatment, the PMPs showed 70% improvement in their symptoms in the presence of both treatment and lifestyle change and 30% improved with lifestyle changes.

For the correlation, the study found significant ($p < 0.05$) positive correlations between the occurrence of migraine and the response to treatment in the affected children. There are positive correlations between the frequency of attacks and the severity of migraine; the duration of migraine and frequency of attacks; the duration of follow-up and response to treatment; the age and duration of follow-up; and the frequency of attacks and response to treatment.

Discussion

The study's results regarding the frequency and severity of migraine attacks were also of interest: on average, participants had 7.2 attacks per month and a mean severity score of 5.7 on a 0-10 scale. These results are consistent with previous research, which also found that childhood migraine can be a seriously debilitating condition, with frequent and often severe headache episodes that can impair the child's ability to participate in daily activities (of course, not all episodes will necessarily be as severe) (16, 17).

Interestingly, a reported family history of migraine was found in 60% of the pediatric cohort, which is also consistent with the established genetic component of migraine that has been extensively analyzed both in the adult and pediatric populations (16). Family history may play a role in the diagnosis and management of pediatric migraine.

The study found that the most reported trigger factors were stress (37%), lack of sleep (23%), certain foods (14%), weather (12%), and physical activity (13%). These prevalence data resonate with previous literature reporting different environmental and lifestyle factors as triggers that can be associated with the onset and worsening of children's and adolescents' migraines (17).

These reported symptoms, such as nausea (45%), photophobia (38%), and phonophobia (33%), mimic the classic description of migraine in the pediatric population and can profoundly interfere with a child's functioning, often warranting targeted management strategies (18).

Regarding the treatment modalities, most patients (70%) received medications and lifestyle changes as an intervention, while 30% had only lifestyle intervention. This approach is supported by the present recommendations for the treatment of kids with pediatric migraine, which states that the treatment of migraine in children and adolescents consists of a combination of pharmacological and non-pharmacological therapies (18). The high positive responders observed in the treatment interventions indicate that a comprehensive and tailored approach could be effective in the treatment of pediatric migraine.

Several studies have reported higher rates of sleep disorders in children with migraine and have found that various headache subtypes are precursors for childhood sleep disturbances. Ludvigsdottir et al. studied parent-reported complaint frequency of sleep problems, the regularity of sleep, and other potential stressors (school, leisure, and friends) at baseline (19-23).

The present study showed a 53.1% male and 46.9% female distribution among our patients, which is like that reported in general pediatric migraine studies. For example, Victor et al. (24) reported a similar distribution, while others have reported slightly more females in post-puberty. Our patients were 10.5 years of age on average, which is like that reported in other pediatric migraine studies (typically between 7 and 11 years of age at onset). Our study cohort also reported a migraine duration of 25.3 months. This agrees with the 24-month mean duration of migraine reported by Hershey et al. (25) and Winner et al. (26). The mean frequency of 7.2 attacks per month and a mean severity score of 5.7 out of 10 in our study are comparable to that reported in other similar studies. For example, Powers et al. (27) reported a mean frequency of 6.8 attacks per month in similar pediatric populations.

The most common associated symptoms identified by our study included nausea (45%), photophobia (38%), and phonophobia (33%), which were similar findings to those previously reported by Hershey et al. (28) among pediatric migraine sufferers. The high prevalence of nausea and photophobia is consistent with the common symptom profile described in pediatric migraines. Sixty percent of patients in our study had a family history of migraine; this is also in keeping with the genetics literature, with Russell et al. (29) on pediatric migraine history of the condition. The common trigger factors identified by our study are also commonly reported in the literature, e.g., Millichap and Yee (30).

Medication dominated as a single therapy in our cohort (70%), with lifestyle changes (30%) significant as well. The balanced approach is consistent with the recommendations of treatment efficacy by the American Academy of Neurology and the Child

Neurology Society, which recommend a balanced combination of pharmaco- and non-pharmacologic treatments for a child with a migraine. Our results are similar to those by Lewis et al. (32), who also found a response rate of 70-80% through medication and lifestyle changes using similar protocols.

An overall mean follow-up of 11.5 months allowed a reasonable period to evaluate the efficacy of the treatments applied in the short and, especially, the long run, as longer follow-ups have been proven to be essential to evaluate the effectiveness of migraine interventions. Studies on children and adolescents have pointed out that long-term follow-up is required to evidence the chronic nature of pediatric migraine and the durability of the effects of treatments: such is the case of the study on childhood migraine by Bille (33).

Conclusion

This elaborate analysis elucidates the burden of migraines in children in terms of the prevalence, recurrence, family history, associated trigger factors, and varied symptoms, and this needs special management as kids and adolescents differ from adults and require a tailored management approach. It also highlights the role of family history, trigger factors, and associated symptoms in managing pediatric migraines. The study holds value in guiding the clinical practices of doctors to optimize the clinical outcome in pediatric migraine patients.

References

1. Eigenbrodt AK, Ashina H, Khan S, Diener HC, Mitsikostas DD, Sinclair AJ, Pozo-Rosich P, Martelletti P, Ducros A, Lantéri-Minet M, Braschinsky M. Diagnosis and management of migraine in ten steps. Nature Reviews Neurology. 2021 Aug;17(8):501-14. https://doi.org/10.1038/s41582-021-00509-5

2. Rossi MF, Tumminello A, Marconi M, Gualano MR, Santoro PE, Malorni W, Moscato U. Sex and gender differences in migraines: a narrative review. Neurological Sciences. 2022 Sep;43(9):5729-34.https://doi.org/10.1007/s10072-022-06178-6

3. Swartwood S, Pham K, Candee MS. Pediatric migraine phenomena and variants: don't let them go over your head. Current Pain and Headache Reports. 2020. https://doi.org/10.1007/s11916-020-00879-3

4. Lucas C. Migraine with aura. Revue neurologique. 2021. https://doi.org/10.1016/j.neurol.2021.07.010

5. Esposito M, Antinolfi L, Carotenuto M. Neuropsychological Profile in Pediatric Migraine without Aura: A Pilot Study. Brain Sciences. 2021. https://doi.org/10.3390/brainsci11121582

6. Genc D, Vaičienė-Magistris N, Zaborskis A, Şaşmaz T, Tunç AY, Uluduz D, Steiner TJ. The prevalence of headache disorders in children and adolescents in Lithuania: a schools-based study. The Journal of Headache and Pain. 2020 Dec;21:1-9. https://doi.org/10.1186/s10194-020-01146-x

7. Genc D, Vaičienė-Magistris N, Zaborskis A, Şaşmaz T, Tunç AY, Uluduz D, Wöber C, Wöber-Bingöl Ç, Steiner TJ. The burden attributable to headache disorders in children and adolescents in Lithuania: estimates from a national schools-based study. The Journal of Headache and Pain. 2021 Dec;22:1-9. https://doi.org/10.1186/s10194-021-01237-3

8. Kawatu N, Wa Somwe S, Ciccone O, Mukanzu M, Uluduz D, Şaşmaz T, Yalçın BN, Wöber C, Steiner TJ. The prevalence of primary headache disorders in children and adolescents in Zambia: a schools-based study. The Journal of Headache and Pain. 2022 Dec;23(1):118. https://doi.org/10.1186/s10194-022-01477-x

9. Youssef PE, Mack KJ. Episodic and chronic migraine in children. Developmental Medicine & Child Neurology. 2020 Jan;62(1):34-41. https://doi.org/10.1111/dmcn.14338

10. Gazerani P. Migraine and mood in children. Behavioral Sciences. 2021. https://doi.org/10.3390/bs11040052

11. Khan J, Al Asoom LI, Al Sunni A, Rafique N, Latif R, Al Saif S, Almandil NB, Almohazey D, AbdulAzeez S, Borgio JF. Genetics, pathophysiology, diagnosis, treatment, management, and prevention of migraine. Biomedicine & pharmacotherapy. 2021 Jul 1;139:111557. https://doi.org/10.1016/j.biopha.2021.111557

12. Dallavalle G, Pezzotti E, Provenzi L, Toni F, Carpani A, Borgatti R. Migraine symptoms improvement during the COVID-19 lockdown in a cohort of children and adolescents. Frontiers in Neurology. 2020 Oct 8;11:579047. https://doi.org/10.3389/fneur.2020.579047

13. Reidy BL, Riddle EJ, Powers SW, Slater SK, Kacperski J, Kabbouche MA, Hershey AD. Clinic-based characterization of continuous headache in children and adolescents: comparing youth with chronic migraine to those with new daily persistent headache. Cephalalgia. 2020 Sep;40(10):1063-9. https://doi.org/10.1177/0333102420920644

14. Das R, Qubty W. Retrospective observational study on riboflavin prophylaxis in child and adolescent migraine. Pediatric Neurology. 2021. https://doi.org/10.1016/j.pediatrneurol.2020.09.009

15. Burch RC, Loder S, Loder E, Smitherman TA. The prevalence and burden of migraine and severe headache in the United States: updated statistics from government health surveillance studies. Headache. 2015;55(1):21-34. doi:10.1111/head.12482

16. Gelfand AA. Pediatric and adolescent headache. Continuum (Minneap Minn). 2018;24(4, Headache):1108-36. doi:10.1212/CON.0000000000000638

17. Hershey AD. Current approaches to the diagnosis and management of pediatric migraine. Lancet Neurol. 2010;9(2):190-204. doi:10.1016/S1474-4422(09)70303-5

18. Kacperski J, Hershey AD, O'Brien HL. The role of preventive medications in pediatric migraine prevention. Pediatr Drugs. 2016;18(6):471-80.

19. Wöber-Bingöl Ç. Epidemiology of migraine and headache in children and adolescents. Curr Pain Headache Rep. 2013;17(6):341. doi:10.1007/s11916-013-0341-z

20. Tiseo C, Vacca A, Felbush A, Filimonova T, Gai A, Glazyrina T, Hubalek IA, Marchenko Y, Overeem LH, Piroso S, Tkachev A. Migraine and sleep disorders: a systematic review. The journal of headache and pain. 2020 Dec;21:1-3. https://doi.org/10.1186/s10194-020-01192-5

21. Stanyer EC, Creeney H, Nesbitt AD, Holland PR, Hoffmann J.

Subjective sleep quality and sleep architecture in patients with migraine: a meta-analysis. Neurology. 2021 Oct 19;97(16):e1620-31. https://doi.org/10.1212/WNL.0000000000012701

22. Waliszewska-Prosół M, Nowakowska-Kotas M, Chojdak-Łukasiewicz J, Budrewicz S. Migraine and sleep-an unexplained association?. International journal of molecular sciences. 2021 May 24;22(11):5539. https://doi.org/10.3390/ijms22115539

23. Bertisch SM, Li W, Buettner C, Mostofsky E, Rueschman M, Kaplan ER, Fung J, Huntington S, Murphy T, Stead C, Burstein R. Nightly sleep duration, fragmentation, and quality and daily risk of migraine. Neurology. 2020 Feb 4;94(5):e489-96. https://doi.org/10.1212/WNL.0000000000008740

24. Victor, T. W., Hu, X. H., Campbell, J. C., Buse, D. C., & Lipton, R. B. (2010). Migraine prevalence by age and sex in the United States: a life-span study. Cephalalgia, 30(9), 1065-1072.

https://doi.org/10.1177/0333102409355601

25. Hershey, A. D., Powers, S. W., Vockell, A. L., LeCates, S. L., Segers, A., & Kabbouche, M. A. (2009). PedMIDAS: development of a questionnaire to assess disability of migraines in children. Neurology, 53(5), 644-649.

26. Winner, P., Lewis, D., Visser, W. H., Jiang, H., & Shalmi, C. (2003). Rizatriptan 5 mg for the acute treatment of migraine in adolescents: a randomized, double-blind, placebo-controlled study with a long-term open-label extension. Headache, 43(7), 781-792.

27. Powers, S. W., Kashikar-Zuck, S. M., Allen, J. R., LeCates, S. L., Slater, S. K., Zafar, M., & Hershey, A. D. (2017). Cognitive behavioral therapy plus amitriptyline for chronic migraine in children and adolescents: a randomized clinical trial. JAMA, 310(24), 2622-2630. https://doi.org/10.1001/jama.2013.282533

28. Hershey, A. D., Powers, S. W., LeCates, S. L., Kabbouche, M. A., & Maynard, M. K. (2009). Headache disability in pediatric patients with chronic daily headache. Cephalalgia, 29(6), 620-624.

29. Russell, M. B., & Olesen, J. (1995). Increased familial risk and evidence of genetic factor in migraine. BMJ, 311(7004), 541-544. https://doi.org/10.1136/bmj.311.7004.541

30. Millichap, J. G., & Yee, M. M. (2003). The diet factor in pediatric and adolescent migraine. Pediatric Neurology, 28(1), 9-15. https://doi.org/10.1016/S0887-8994(02)00466-6

31. Silberstein, S. D., Lipton, R. B., & Dalessio, D. J. (Eds.). (2001). Wolff's Headache and Other Head Pain. Oxford University Press.

32. Lewis, D. W., Diamond, S., Scott, D., & Jones, V. (2004). Prophylactic treatment of pediatric migraine. Headache, 44(3), 230-237. https://doi.org/10.1111/j.1526-4610.2004.04052.x

33. Bille, B. (1996). A 40-year follow-up of school children with migraine. Cephalalgia, 16(4), 208-213. https://doi.org/10.1046/j.1468-2982.1997.1704488.x